Montana Fish, Wildlife & Parks

1400 South 19th Avenue
Bozeman, MT 59718

March 30, 2018

To: Governor's Office, Tim Baker, State Capitol, Room 204, P.O. Box 200801, Helena, MT 59620-0801
Environmental Quality Council, State Capitol, Room 106, P.O. Box 201704, Helena, MT 59620-1704
Dept. of Environmental Quality, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901
Dept. of Natural Resources & Conservation, P.O. Box 201601, Helena, MT 59620-1601
Montana Fish, Wildlife & Parks:

Director's Office	Parks Division	Lands Section	FWP Commissioners
Fisheries Division	Legal Unit	Wildlife Division	Design & Construction

MT Historical Society, State Historic Preservation Office, P.O. Box 201202, Helena, MT 59620-1202
MT State Parks Association, P.O. Box 699, Billings, MT 59103
MT State Library, 1515 E. Sixth Ave., P.O. Box 201800, Helena, MT 59620
James Jensen, Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624
Janet Ellis, Montana Audubon Council, P.O. Box 595, Helena, MT 59624
George Ochenski, P.O. Box 689, Helena, MT 59624
Jerry DiMarco, P.O. Box 1571, Bozeman, MT 59771
Montana Wildlife Federation, P.O. Box 1175, Helena, MT 59624
Wayne Hurst, P.O. Box 728, Libby, MT 59923
Jack Jones, 3014 Irene St., Butte, MT 59701
U.S. Army Corp of Engineers, Helena
U.S. Fish and Wildlife Service, Helena
U.S. Fish and Wildlife Service, 420 Barrett Street, Dillon, MT 59725
Big Hole Watershed Committee, P.O. Box 931, Butte, MT 59703
Montana Trout Unlimited, P.O. Box 7186, Missoula, MT 59807
Dan Vermillion, FWP Commissioner, Livingston MT
Earnest and Colleen Bacon, 2215 Fishtrap Creek Road, Wisdom, MT 59761
Dept. of Natural Resources and Conservation, 730 N. Montana Street, Dillon, MT 59725-9424
George Grant Chapter of Trout Unlimited, P.O. Box 563, Butte, MT 59703
Skyline Sportsmen, P.O. Box 173, Butte, MT 59703
Anaconda Sportsmen, 2 Cherry, Anaconda, MT 59711
E.T. Bud Moran, Chairman CSKT, PO Box 278, Pablo, MT 59855
Al Lubeck, 2710 Amherst, Ave, Butte, MT 59701
Adam Rissien, ORV Coordinator, Wildands CPR, PO Box 7516, Missoula, MT 59807
Josiah Pinkham, Tribal Arch., Nez Perce Tribe, PO Box 365, Lapwai, ID 83540
John and Sandy Gordon, 119033 Juniper Acres Rd, Butte, MT, 59750
Phil Ralston, 54289 MT Highway 43, Wise River, MT 59762
Martin White, 3308 46th Ave. SE, Mandan ND, 58554-4730
Jerry Lussie, 305 Main Street, Anaconda, MT 59711
Jim Schmeller, Montana Living Trust, 4935 Everett Rd, Akron, OH 44333
Kieth and Jean Rankin, P.O. Box 28, Anaconda, MT 59711
Richard Seddon, 2017 Harrison Ave# 237, Butte, MT 59701
Haddox Ventures LLC, 9141 Briar Forest Dr., Huston, TX 77024
Frank Stanchfield, 62311 Hwy 43, Wise River, MT 59762
Bryon Lacey, 4034 Elizabeth Warren #1, Butte MT 59701
Mathew White, 4977 Foothill Rd, Butte, MT 59701
Lewis Pesanti, 1424 Sunrise Ln, Butte, MT 59701
Jim Street, 448 Red Fox Rd., Wise River, MT 59762

Donna Brown, P.O. Box 4, Wise River, MT 59762
Jim Bacon, 1000 Bossard Rd, Anaconda, MT, 59711
Bart Bacon, 3014 Carter St, Butte, MT, 59701
Bart Riley, 116057 Boulder Road, Butte MT 59750
Wade Fellin, 36894 Pioneer Mountains Scenic, Wise River, MT 59762
Don Stodden, P.O. Box, 96, Wise River, MT 59762
Debbie and Mike Robbins, 750 Alder Creek Rd, Wise River MT 59762
J.P. Gordon, 709 Illinois St., Butte, MT 59701
Chuck Buehler, 481 Little Basin Creek Road, Butte MT 59701
Tony Schoonen, 3609 Willoughby, Butte, MT 59701
Lee Krugerud, 1541 Lower Seymour Lake Road, Wise River MT 59762
Jason Barlman, 1901 Florence, Butte MT 59701
Steve Luebeck, 17 Queens Court, Butte MT 59701
Paul Olson, 524 Wolf Ridge Road, Wise River MT 59762
Scott Reynolds, 1700 Shirley Way, Anaconda MT 59711
Jack Hancock, 1374 Deep Creek Road, Wise River MT 59762

Dear Interested Party:

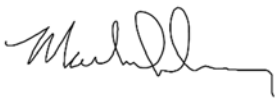
Montana Fish Wildlife and Parks (FWP) is proposing to restore habitat and native aquatic species in the French Creek watershed in the Big Hole River drainage. This Draft EA is available for review on FWP's website: http://www.fwp.mt.gov.

Montana Fish, Wildlife & Parks invites you to comment on the attached proposal. Public comment will be accepted until April 30, 2018. Comments should be sent to the following address:

Montana Fish, Wildlife & Parks
French Creek Restoration Supplemental Analysis
Attn: Jim Olsen
1820 Meadowlark Ln.
Butte, MT 59701

Or e-mailed to: jimolsen@mt.gov

Sincerely,



Mark Deleray
Region Three Supervisor
Attachment

Supplemental Analysis for the Restoration of Westslope Cutthroat Trout and Arctic Grayling to French Creek

Public Comment Period open from March 30 to April 30.
Public Meeting to be held on April 26 at 6:30 pm at the Copper King Hotel
Written comments regarding this proposal should be mailed to:

Montana Fish, Wildlife & Parks
French Creek Restoration Supplemental Analysis
Attn: Jim Olsen
1820 Meadowlark Ln.
Butte, MT 59701

Or e-mailed to: jimolsen@mt.gov

Montana Fish Wildlife and Parks (FWP) is proposing to restore habitat and native aquatic species in the French Creek watershed in the Big Hole River drainage. An Environmental Assessment detailing this multifaceted project was released on April 29, 2016, for public comment. At that time, a total of 2 written comments were received and a Decision Notice (DN) was issued and signed on June 13, 2016. It was subsequently discovered that landowners within and immediately downstream of the project area had been accidentally omitted from the mailing list for the initial public comment period. A second announcement was generated and sent to these landowners, and the comment period was extended to allow for input from the landowners that were missed. No additional written comments were received, and the original DN was not modified. In the fall of 2017 as the fish barrier portion of the project was put out to bid, FWP staff became aware of some additional questions and concerns that local landowners had regarding the project. A public meeting was held in Wise River August 31, 2017, and FWP solicited and listened to these concerns. In response to these questions and concerns, FWP performed additional analyses, made some changes to the proposed plan, and determined to accept additional comments by issuing an Environmental Assessment Supplemental Analysis. This document represents that supplemental analysis.

The original Environmental Assessment for French Creek restoration work had three main components. The first was restoration of areas in the upper watershed impacted by atmospheric deposition of harmful substances from the Anaconda Smelter. This restoration work focused on establishing vegetation on unvegetated slopes of Sugarloaf Mountain, and the creation of sediment retaining structures to reduce copper and arsenic laden sediments from reaching California Creek. This work has been initiated but is not yet entirely complete. The second component consisted of restoration of placer-mined reaches of French Creek, French Gulch, Oregon Creek, and Moose Creek. The goal of this restoration was to restore stream habitat, floodplain function, and fish passage in mined reaches of streams. Portions of this restoration work are complete while others are pending. The third component of the project is native fish restoration in French Creek. Native fish restoration would consist of constructing a fish migration barrier on French Creek near the downstream boundary of the Mount Haggin Wildlife Management Area (WMA) and removing non-native fish upstream of this barrier. This fish barrier would consist of an earthen dam with a concrete spillway that forms a small waterfall and precludes upstream fish passage. Above the fish barrier, there are more than 40 miles of stream that currently contain fish. Non-native fish (brook, brown, and rainbow trout) would be removed using the piscicide rotenone. Once the fish barrier is in place and non-native trout are removed, native westslope cutthroat trout (WCT) and Arctic grayling (AG) would be stocked into the stream along with the other native fish currently in French Creek which include: mountain whitefish, longnose sucker, Rocky Mountain sculpin, and longnose dace. This component of the project has not been initiated. As the other aspects of watershed restoration are already underway, **public comments will only be accepted on the native fish restoration component of the project.**

Background Information:

Why are we performing native fish restoration?

Westslope cutthroat trout and Arctic grayling are native to the upper Missouri River basin and the Big Hole River drainage. Both species have declined dramatically in distribution and abundance due to habitat degradation and the introduction of non-native fish. Cutthroat trout historically occupied approximately 2,141 miles of stream in the Big Hole drainage, but today they occupy less than 167 miles of habitat (6% of historic range). There are only six secure populations (i.e., those that exist in the absence of non-native fish) remaining that occupy 14 miles of stream. The Big Hole is also the last

remaining fluvial (river dwelling) population of Arctic grayling in the lower 48 states, but abundance and distribution have declined dramatically to 5% of their historic range. Additionally, there are no fluvial Arctic grayling populations that exist in the absence of non-native fish species. If projects are not done to conserve these native fish species, they will likely continue to decline and could be extirpated. The long-term restoration goal for cutthroat trout is to restore cutthroat trout to 20% of their historically occupied habitat. The remaining 80% of available habitat will continue to be managed as non-native brown, rainbow, and brook trout fisheries.

Why French Creek?

French Creek was selected for native fish restoration for three main reasons. First, a suitable site exists to construct a fish barrier. Fish barrier construction generally requires that a stream be confined in a narrow valley. This reduces the overall size of the barrier and the impoundment upstream. It also allows the structure to be tied into stable hill slopes which reduces the potential for water to flank the structure. The second reason French Creek was selected for native fish restoration is the quantity and quality of the habitat upstream. Upstream of the proposed fish barrier site, there are 40 miles of stream that are currently occupied by primarily rainbow and brook trout. Most of French Creek would be considered a "C" type meandering stream channel with large, deep pools and abundant willows. This type of habitat is high quality and can support high fish densities. It is also the type of habitat Arctic grayling occupy in other reaches of the Big Hole. Grayling restoration, such as being proposed in French Creek, has not been attempted by FWP so it is unclear if grayling reintroduction will be successful. Grayling introduction has been successful in the upper Ruby River which has similar habitat to French Creek. Yellowstone National Park has performed a project where non-native fish were removed and Arctic grayling were subsequently reintroduced (Grayling Creek); but it is too soon to tell if the introduction has been successful. FWP has done several projects to restore WCT to streams of the Big Hole and it is likely that WCT will thrive in the high quality habitat in French Creek once non-native fish are removed. If native species restoration is successful in French Creek, the stream would represent the largest tributary population of Arctic grayling and WCT in the Big Hole drainage and the only fluvial population of grayling to exist in the absence of non-native fish. The last reason French Creek was selected for native fish restoration is the habitat restoration projects that are ongoing in the drainage. Among the several goals of these habitat projects was the restoration of spawning habitats, particularly for native fish. Native fish restoration has been a part of the overall restoration goals for the French Creek watershed. Brook, brown and rainbow trout fisheries will remain in Deep Creek which is adjacent to French Creek on the Mount Haggin Wildlife Management Area providing recreational angling for non-native fish species. Restoring native fish to French Creek will diversify the fishing opportunities on the WMA and will greatly aid in the conservation of these two native fishes.

How is native fish restoration done?

In order to restore native fish to French Creek, a fish barrier will need to be constructed. A fish barrier would preclude fish from accessing French Creek from below and would isolate native fish upstream from the potential impacts of competition, predation, and hybridization from non-native fish. A suitable location for fish barrier construction has been identified near the downstream boundary of the WMA on French Creek. The barrier would consist of an earthen dam with a concrete spillway. The structure has been designed to pass the 100-year flood event with 1 foot of freeboard through the spillway and to be structurally sound. A qualified engineering firm has been contracted to design and oversee the construction of the fish barrier.

Once the fish barrier is in place, non-native fish in the drainage upstream of the barrier would be removed using the piscicide rotenone. Rotenone is a naturally occurring substance derived from the roots of tropical plants in the bean family such as the jewel vine (*Derris* spp.) and lacepod (*Lonchocarpus* spp.) that are found in Australia, southern Asia, and South America. Rotenone has been used by native people for centuries to capture fish for food in areas where these plants are naturally found. It has been used in fisheries management in North America since the 1930s. Rotenone is highly targeted at fish and has no impact on other terrestrial plants and animals and few impacts to non-target aquatic life at fish killing concentrations. Rotenone acts by inhibiting oxygen transfer at the cellular level. It is especially effective at low concentrations with fish because it is readily absorbed into the bloodstream through the thin cell layer of the gills. Mammals, birds, and other non-gill breathing organisms do not have this rapid absorption route into the bloodstream. If rotenone is ingested by terrestrial organisms, it is readily broken down by digestive processes and is not well absorbed through the gut; thus, terrestrial animals can tolerate exposure to rotenone concentrations much higher than those used to kill fish. Rotenone would be applied to the water at a concentration of 1 part per million parts of water (1 ppm). It is expected that fish killing concentrations of rotenone would be present in the streams for 24-48 hours after application, after which time it would have naturally detoxified and diluted to below fish killing concentrations.

To avoid killing fish downstream of the fish barrier, potassium permanganate would be used to neutralize any rotenone remaining in the stream. Potassium permanganate is a strong oxidizer that quickly breaks down the rotenone molecule into non-toxic compounds. FWP has developed a comprehensive detoxification procedure policy that dictates when neutralizing is to be initiated and when it can be ceased to protect non-target areas from being impacted. A digital meter would be used to test the concentration of potassium permanganate in French Creek at the end of the detoxification zone to ensure adequate oxidation potential and full neutralization of the rotenone. In addition to direct measurement of the oxidation potential of the water, caged fish would be placed in the stream to monitor the effectiveness of the detoxification station during the treatment. Fish are the most sensitive aquatic organism to rotenone. Caged fish would be placed downstream of the detoxification zone and above the fish barrier and monitored. Distress or the lack thereof in these caged fish indicates efficacy of the neutralization station and when neutralization is no longer necessary. The rotenone label states that if sentinel fish in treated stream water show no signs of distress within 4 hours, the stream water is considered to be no longer toxic, and detoxification can be discontinued. Neutralization would continue until the theoretical time in which all treated waters have passed the fish barrier and when sentinel fish can survive for an additional 4 hours. It is anticipated that this would occur in French Creek within 24-48 hours after rotenone application.

To keep the public from being exposed to rotenone treated waters, specific public accesses and roads would be closed during treatment. These closed areas may include secondary primitive roads that access a single drainage. Signs would be placed at stream crossings and other access points (i.e., trailheads) during the treatments including signage at stream crossings informing the public of the presence of treated waters and to keep out. These areas would be closed only when rotenone is being actively applied. Once rotenone is mixed into the receiving waters at the proposed application concentration, restriction of access is no longer necessary as per the product label.

It is likely that multiple rotenone treatments will be necessary in French Creek to completely remove brook and rainbow trout due to the large size of the drainage and the complexity of the habitat (i.e.,

beaver dams). A minimum of 2 and as many as 5 full stream treatments may be done in the drainage to remove non-native fish.

Once non-native fish are removed, WCT and Arctic grayling would be restocked into French Creek and its tributary streams. Restocking would likely occur through a combination of introducing live fish and incubation of eggs through the use of remote streamside incubators (RSI's). To jumpstart the fishery in the stream, triploid (sterile) WCT from the Anaconda hatchery may be introduced to French Creek to provide a recreational fishery if there is public feedback that indicates that rapid creation of a fishery is desired after treatment. The primary source of WCT eggs to restock French Creek and its tributaries would be from the Big Hole drainage. These eggs would most likely come from the Cherry Creek drainage near Melrose where WCT were restored to the stream and headwater lakes 5 years ago. The fish that were used to restock the stream and lakes were from multiple sources within the Big Hole River drainage. The source of Arctic grayling reintroduction would be the Big Hole River brood stock maintained at Axolotl and Green Hollow lakes. Eggs or fry from both species would be introduced to French Creek and its tributaries for a minimum of 3 to 4 consecutive years after non-native fish removal is accomplished after which time it is anticipated that the streams will become self-sustaining and will require no additional stocking.

Over the past 4 years, there have been 11 westslope cutthroat restoration projects completed in the Big Hole River drainage totaling 57 miles of stream. Restoration of cutthroat and grayling to French Creek and its tributaries would add an additional 40 miles of stream and would nearly double the amount of secured habitat for the native fish in the Big Hole. French Creek would represent the largest population of WCT in the Big Hole drainage and the second largest population in the Missouri River drainage. It would represent the only location in Montana where native grayling would exist in the absence of non-native fish. Because of its large size and several tributary streams, native fish would be able to express multiple life-histories. Projects which restore WCT are necessary to ensure the continued conservation of the species and prevent their listing as threatened or endangered.

Supplementary Analysis:

As a result of the comments received at the August 31, 2017, Wise River meeting, changes were made to the original proposal and additional information was collected. These changes and additional information are detailed below. Other details of the fish barrier and native fish restoration component of the project can be found in the original Environmental Assessment (http://fwphlncmstst002.mt.gov/news/publicNotices/environmentalAssessments/restorationAndRehab/pn_0154.html). The main change from the original analysis conducted in 2016 is the access route to the fish barrier site. The original proposal called for the construction of over 6,100 ft of road through the WMA from Highway 569 upstream of the fish barrier site. This route did not cross private lands, and after construction of the fish barrier was complete the road was to be reclaimed. The newly proposed route to access the fish barrier site is detailed in Figure 1. This access would be obtained through private property downstream of the fish barrier. An existing logging road is present from Highway 569 to near the southern WMA boundary. From this point, an additional 1,900 ft of road would be constructed from the WMA property boundary to the fish barrier site. This road would bisect a lodgepole pine forest before it reaches the fish barrier site.

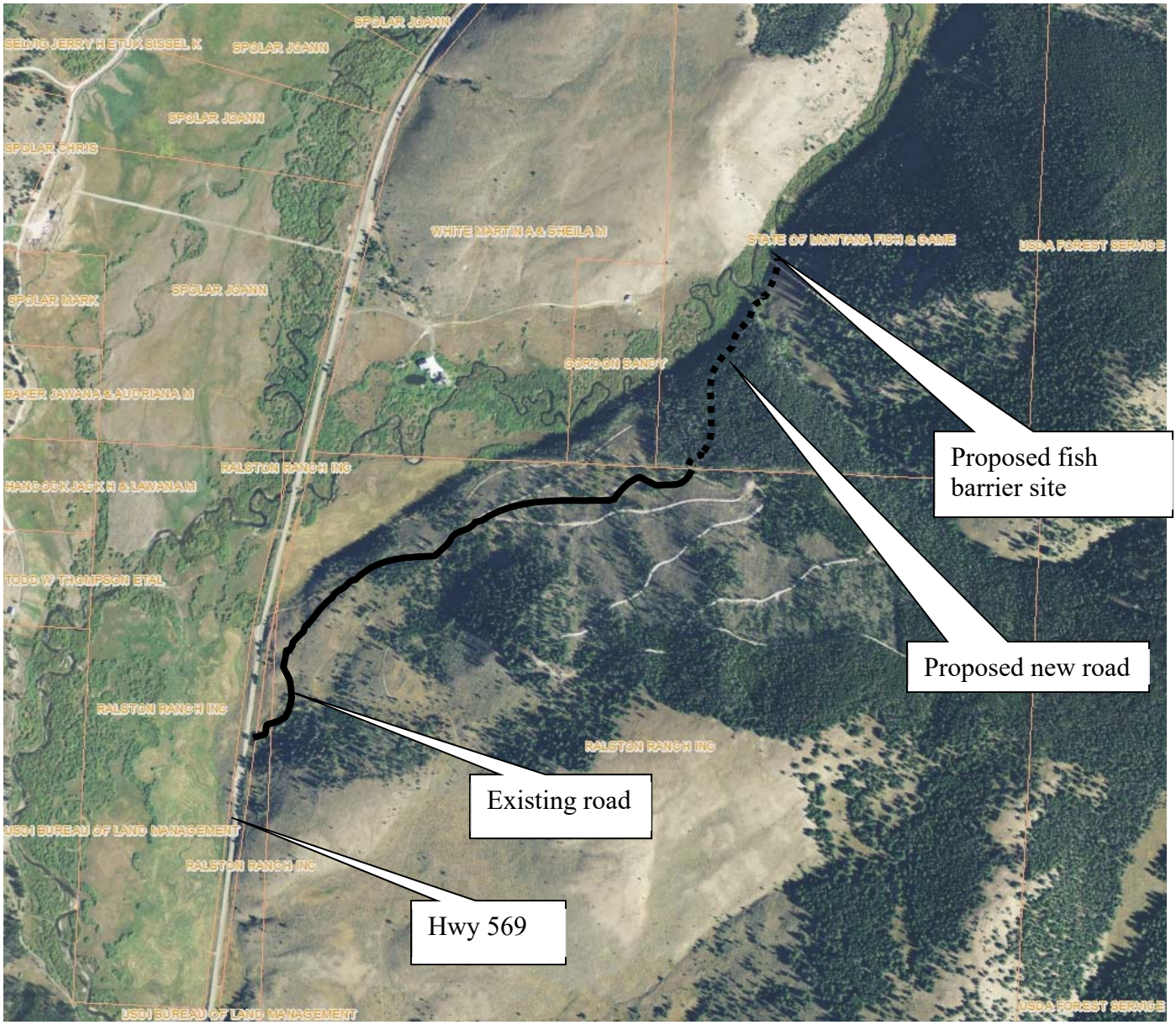


Figure 1. Aerial imagery of the proposed barrier site and new access route. The solid line represents an existing road and the dashed line represent road that will be constructed to access the fish barrier site for construction.

The proposed new road to the fish barrier site would be cut into the hill that descends to the fish barrier site from the WMA boundary. The road would descend approximately 160 ft over a 1,900 ft run to the floodplain of French Creek at an average slope of 8.4%. Based on the material composition of the hillslope and feedback from the adjacent landowner, it is unlikely that importing material for the road surface (i.e., crushed gravel) will be necessary because the native substrate is highly suitable roadbed material. The proposed road crosses two small ephemeral drainages which will have drainage culverts installed. A culvert will also be placed in a small drainage entering French Creek from the east with perennial flow (less than 0.1 cfs and no fishery). Once the road reaches the riparian area of French Creek, it would be located at the toe of the hillslope to reduce any impacts to the riparian area and to

avoid any potential wetlands at the site. This road would be used as the primary access route for construction and any potential future maintenance of the fish barrier if necessary. The road would also be used during fish removals to transport neutralization equipment to the fish barrier. Once fish removals are complete, the road would be closed and decommissioned. Decommissioning would consist of a gate between private property and the WMA, the felling of dead or dying trees, and scattering of slash across the road to prevent vehicular traffic (see Figure 2). The culverts would be left in place. The road surface would also be seeded if native grasses have not yet become established. Road closure after fish removal is complete would also involve drainage improvements if erosion is occurring on the road surface. Annual inspection of the fish barrier site would be done on foot. If maintenance of the fish barrier becomes necessary, the road would be reactivated only for the time required to perform the maintenance, then closed again. The road would not be open to public or private traffic. This alternative route reduces the impact to resources compared to the route proposed in the original Environmental Assessment and provides for better access to the site for long-term inspections and maintenance.

Figure 2. Example of a closed and decommissioned road on the Mt Haggin WMA in 2014 (left) and the same site 3 years later (right).

The fish barrier structure consists of an earthen dam with a concrete spillway (Figure 3). The concrete spillway crest is 10 ft above the existing bed of the stream (14 ft to the top of the structure) and 30 ft wide with 20 ft wing walls on either side. The earthen portion of the structure is 140 ft long and the same height as the top of the concrete structure. The entire length of the structure which spans the valley bottom is just over 200 ft. The earthen berm portion of the fish barrier has been designed with a geotextile fabric and riprap face on the downstream side of the barrier to prevent erosion and failure if the structure were to overtop. The structure will create a 2-acre impoundment upstream. The capacity of this impoundment after construction would be 12.5 acre-ft of water which is well below the minimum of 50 acre-feet of water that the DNRC considers a potentially high hazard dam. The size and height of the structure were determined by standard engineering practices. The structure was designed to pass the 100-year flood event through the concrete spillway structure with 1 ft of freeboard while providing a fish passage barrier up to the 50-year flood event. The elevation of the water surface at the 100-year and 50-year flood events determine the height and width of the concrete portion of the

structure. The length of the earthen part of the structure is necessary to tie the concrete portion of the structure into the adjacent hillslopes. Figure 4 shows a completed fish barrier on Cherry Creek near Melrose using the same design concept. The concrete portion of the fish barrier on French Creek would be 22 ft wider and 1.5 ft taller than the structure on Cherry Creek because French Creek is a much larger stream. The impoundment created upstream of the fish barriers will fill up with sediment over time. The pond upstream of the structure shown in Figure 4 filled completely after 2 years. It is anticipated that within 5-10 years the impoundment upstream of the French Creek fish barrier will completely fill with sediment, and at that point there would be no pond or any storage capacity and just a stream channel flowing through a wetland area and over the barrier. Therefore, the impacts of the fish barrier on the stream and riparian area would be short term and minor.

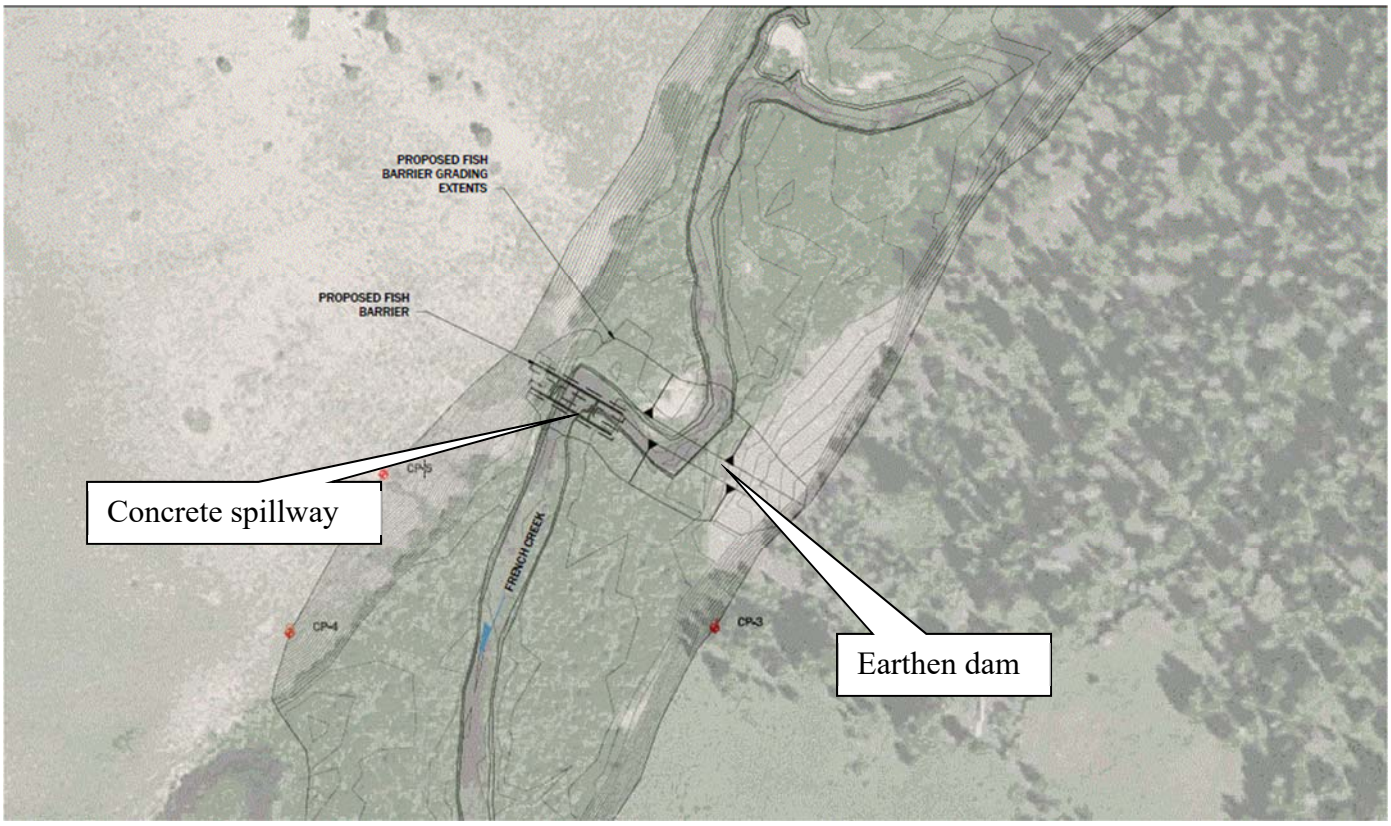


Figure 3. Drawings of the proposed fish barrier on French Creek showing the concrete spillway and earthen portions of the structure

Figure 4. Fish barrier on Cherry Creek near Melrose, MT which is similar in design to the proposed barrier on French Creek. Because French Creek is a larger stream, the spillway is 20 ft wider and 1.5 ft taller.

Alternative barrier locations were considered in this analysis; however, the original proposed location remained the preferred location for fish barrier placement because it is the narrowest point in the drainage which reduces the required length of the earthen embankment. The proposed barrier location is also the only site in the drainage where the valley is confined by high stable slopes into which the barrier structure can be keyed. An alternative fish barrier site was suggested at the crossing on Highway 569 upstream of the proposed fish barrier. The highway fill placed in the floodplain of French Creek does constrict the floodplain of the stream at this location. However, it is unknown if the fill in the highway subgrade would meet the specifications for dam material. Also, saturation of this fill with water from the pond created upstream is unacceptable because of the impacts this can have on the stability and longevity of the highway. If a barrier at this location were not tied into the highway fill, the earthen berm portion of the barrier would be over 800 ft long to tie into the higher stable ground on each side of the valley and therefore would be cost prohibitive. Furthermore, the size of the impoundment created upstream of a structure in this location would be significantly larger than the one at the proposed site which could have impacts on water quantity and quality and could increase the risks of flooding downstream in the event of a dam breach. For these reasons, a formal hydrologic analysis of this site was not conducted.

Flood Analysis

The 100-year flood event at the fish barrier site was estimated at 721 cfs, and the 50-year event was estimated at 636 cfs. Normal high flows (2-year event) was estimated at 215 cfs, and base flows are approximately 10-15 cfs. An analysis of the fish barrier structure was conducted by an independent engineering firm to determine the impact of the fish barrier on flows and water surface elevation

downstream of the barrier. To determine the potential impacts on flows and water surface elevation due to barrier installation, ground survey information was collected from the floodplain of French Creek immediately downstream of the fish barrier downstream to the WMA boundary and immediately upstream of the Highway 569 crossing. Access to private property between these two locations was not granted, so 10-meter resolution digital elevation models (DEM) were used to predict ground surface elevations. The DEM data were combined with the on the ground survey to produce ground surface elevations from upstream of the fish barrier to near the crossing of Highway 569. The stream channel characteristics from unsurveyed reaches of the stream were interpolated from channel dimensions measured in other reaches. A 2D HEC-RAS 5.0.3 model was used to predict water surface elevations throughout the reach under different flow scenarios.

A flood analysis was done using these data to determine the changes in water surface elevation downstream with and without the fish barrier (WET 2018a). The analysis concluded that the fish barrier will have no effect on the water surface elevation of French Creek downstream of the fish barrier on private property. At all flows modeled up to the 100-year flood event, there were no significant changes in predicted water surface elevation downstream after the fish barrier is installed. The barrier has been designed to pass the 100-year flood event with 1 ft of freeboard remaining to the top of the spillway. The flow capacity of the concrete spillway is nearly 2,000 cfs which is nearly 3 times the predicted 100-year flood event. Because of the size of the proposed spillway, there is not expected to be any change in the way water moves down French Creek up to and beyond the 100-year flood event. Water coming into the fish barrier exits the fish barrier with no expected change in quantity or surface elevation at downstream properties.

Breach Analysis

A second analysis was done on the fish barrier to determine the impacts on water surface elevation downstream of the fish barrier if the earthen portion of the dam were to fail. Two events were examined: breach of the earthen dam portion of the barrier at low flows (17 cfs), and a breach occurring at the 100-year flood event (721 cfs). Both analyses had to assume a worst-case scenario where the spillway structure was completely blocked which causes the earthen dam to overtop (this was because the spillway can convey flows up to and well beyond the 100-year flood event). The analyses also had to assume that the riprap on the downstream face of the dam to protect it from erosion fails completely and the water cuts down through the dam to the original channel elevation in 15 minutes. The analyses also assumed a full reservoir of water behind the dam and that the reservoir volume was not reduced due to sediment deposition post construction. Presented here are the results of the worst-case scenario where the earthen portion of the dam fails only 30 minutes after the peak 100-year flood event. All other potential events such as the barrier failing at low flows (i.e., if blocked by a beaver dam or earthquake-caused failure) produce flows and water surface elevations less than the worst-case scenario presented below. There are two residences located downstream of the fish barrier to Highway 569. The upstream house closest to the fish barrier is constructed at the toe of the hillslope and out of the riparian area. The second residence downstream consists of a primary home and several additional buildings and is constructed in the riparian area of French Creek. Surface water elevations were predicted at each of these residences using cross sections that bisect the main homes and are perpendicular to the flow of the stream. Conservative assumptions were made to estimate the predicted water surface elevation at these residences because access was not allowed to collect ground survey data. If the earthen portion of the fish barrier were to breach during the 100-year flood event, the water surface elevation at the most upstream home is predicted to increase 1.06 ft above the existing water surface at the 100-year flood. This increase in water surface elevation poses no threat

to the upstream residence because the predicted water surface elevation does not approach the estimated elevation of the of the house based on 10-meter DEM elevation data. At the downstream residence, the surface elevation of the 100-year flood was predicted to intersect the structure closest to the stream (main house). If the dam were to breach during the 100-year flood, the water was predicted to rise 0.85 ft or 10.2 inches. It is not known if the water surface elevation during flood events would intersect the house as the model is based on a 10-meter terrain data set. However, if the structure was built according to floodplain regulations, it should be at least 13.8 inches above the predicted water surface (see discussion below).

A review of floodplain development standards was conducted (WET 2018b). Based on the Cadastral records, the downstream residence on French Creek was constructed in 1986 with an addition in 2007. The upstream residence on French Creek was built in 1985. Floodplain Ordinances in Deer Lodge County were recorded as follows:
Resolution #90, Adopted 1/13/1983;
Ordinance #93, Revised 12/15/1986, Adopted 8/5/1987;
Ordinance #106, Revised 1/9/1990, Adopted 4/3/1991; and
Municipal Code Ordinance obtained via website, Adopted 1995.

The Floodplain Ordinance adopted in 1983 would have been the regulatory document at the onset of development and required the following for Zone A floodplains on page 42 and 43 of the document: Regulation for development in Zone A floodplains is provided in section 6.01. Section 6.01-B states that "the provisions of Section 5.03-B.5. apply to the Zone A floodplains" and 6.01-B.4 states "If historical flood evidence is not available, then the Floodplain Administrator shall determine, from a field review at the proposed development site, an appropriate fill and/or flood-proofing elevation to be utilized in applying Sections 5.03-B.3". The regulations also state that "Proposed structures must be anchored to prevent flotation or collapse and must be located as far from stream channels as practicable". The references above to Section 5.03-B.3 and 5.03-B.5 are based on floodplain boundaries that have a base flood elevation but apply to Zone A floodplains. Section 5.03-B.3 states that "The new construction, alterations and substantial improvements of residential structures must be constructed on suitable fill such that bottom floor elevations (including basement) are two feet or more above the elevation of the flood of 100-year frequency. The suitable fill shall be at an elevation no lower than the elevation of the flood of 100-year frequency and shall extend for at least fifteen feet, at that elevation, beyond the structures in all directions". Section 5.03-B.5. states that "A development proposed for a 100-year floodplain, where water surface elevations are available, but no floodway is delineated, may not significantly increase flood velocities or depths or generally alter patterns of flood flow. The Floodplain Administrator may require a permit applicant to furnish additional hydraulic data before acting on a permit application for such a floodplain."

Construction after 1995 would fall under the revised Floodplain Ordinance regulations. When the revised ordinance was adopted in 1995, this document included the following clause in Division 4, Section 6-136 (2)(d) (same reference as the 1983 document for 6.01-B.4): "If historical flood evidence is not available, then the Floodplain Administrator shall determine, from a field review at the proposed development site, an appropriate fill or flood-proofing elevation to use in applying Sections 6-09(b)(3) and (4). In the absence of depth or elevation information, a minimum two-foot flood depth shall be used".

In the unlikely event that the fish barrier should breach and assuming the downstream structures were built according to the regulations in 1985 and in 2007 and are a minimum of 2 ft above the 100-year

flood elevation, there should be no impact to the structures because they should be 1.05 ft above the predicted water surface elevation. Further, if the dam were to breach, flows are predicted to return to pre-breach conditions within one hour, so the duration of the higher water surface elevation is short-lived. Conservative assumptions were made during this analysis to produce a worst-case scenario for water surface elevation at both residences, and there appears to be no impacts from the fish barrier to the upstream residence and only minimal potential impact to the downstream structures if they were built according to existing and past regulations.

Because of the large capacity of the spillway structure, the only conceivable way for the earthen portion of the dam to fail is if the spillway is blocked either partly or entirely. Possible mechanisms that could block the spillway include an ice jam, beaver dam, or other debris such as trees. To mitigate for the potential of erosion if overtopping occurs, the downstream face of the earthen portion of the dam will be lined with geotextile fabric and riprapped with class 2 (18 inch and smaller) rocks.

Of the multiple fish barriers constructed across Montana and other states, there has never been an incidence of ice blockage. The reason for this is likely because ice and flow patterns in smaller streams differs greatly from those in larger river systems (Prowse 2000) where ice jams are more common. Smaller streams typically freeze from the bottom up through the formation of frazil ice in shallow riffles (Prowse 2000). Further, small streams typically become covered with snow which forms an insulating blanket and reduces additional ice formation. Another contributing factor to the lack of ice jams in small streams is the stream's ability to move large amounts of ice which then form into jams. The ability of a stream to move ice depends on its flow, depth, and the thickness of the ice being moved. In smaller mountain streams with lower flows and shallower depths, large ice movements are uncommon. Generally, in mountain streams higher flows occur long after the ice has receded from the stream. Therefore, the potential for an ice flow and subsequent jam at the fish barrier on French Creek is very low. The potential for a jam would be mitigated by the width (30 ft) and height of the spillway (4 ft) which would reduce the probability of complete blockage. Further, the riprap on the downstream face of the dam would provide erosion protection if blockage and overtopping occurred.

The potential for beavers to block the spillway on the French Creek fish barrier is also low. The 30-ft wide spillway would require the placement of beaver-transported material that is wider than the spillway to avoid being washed downstream. The available material for beaver dam construction in the area consists of willows which are substantially smaller than the opening of the spillway. Lodgepole pine trees are located near the barrier site, but trees large enough to block the structure would likely be too large for beaver to transport across land to the water. Additionally, the fast water velocities at the spillway would deter beaver dam construction. No beaver dams have been documented at the 7 fish barriers constructed in the Big Hole basin or any others constructed in Montana. There are active beavers immediately upstream and downstream of the Cherry Creek fish barrier near Melrose which has a spillway width of 8 ft and the presence of aspen trees of suitable size to block the spillway opening; however, over the past 7 years no attempts have been made by beaver to block the spillway. The potential for fish barrier blockage due to beavers can be mitigated through annual inspections of the barrier and removal of any beaver dams from the barrier spillway.

The accumulation of trees and other debris could also potentially block the spillway opening. The only reach of stream where there are trees of the size that could get lodged in the opening of the spillway are within the first ¼ mile upstream of the fish barrier. The remainder of the drainage upstream for nearly 10 miles has very few trees within a tree's length of the stream. Many tributaries

are forested, but the streams lack the ability to transport trees to the mainstem creek even during the highest of flows. To mitigate for the potential of trees being entrained by French Creek and getting lodged in the fish barrier, dying trees within 30 ft of the stream would be removed upstream of the fish barrier ¼ mile before or during fish barrier construction. Additional trees that are living but have a high potential of falling into the stream would also be removed. The fish barrier would be inspected annually, and any debris in the spillway would be removed.

The following Environmental Review pertains only to the newly proposed access road leading the fish barrier site. All other aspects of the project are reviewed in the original EA (http://fwphlncmstst002.mt.gov/news/publicNotices/environmentalAssessments/restorationAndRehab/pn_0154.html).

A. PHYSICAL ENVIRONMENT

1. LAND RESOURCES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Soil instability or changes in geologic substructure?			X		Yes	1a
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?			X		Yes	1b
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				

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Comment 1a: The establishment of a new road to the proposed fish barrier site could temporarily affect soil stability in the immediate road construction area. The new road will have an average slope of just over 8% and will traverse a steep hillside. Material will be cut from the hillslope and cast downhill to create a 12 ft wide roadbed. Because the road bisects steep terrain, there is the potential for soil erosion primarily from the road surface itself. To mitigate for these potential impacts, road drainage would be provided to direct flows off the road surface and into drainage ditches. Drainage culverts will be installed to direct flows away from the road surface. The road surface will be built of erosion resistant native gravels similar to the existing road on private property. There is little evidence that the road on private property has experienced significant erosion in the over 30 years it has been in place. Finally, the road surface will be reclaimed once the fish removal portion of the project is complete, and vegetation will be re-established. These actions should eliminate any future potential soil instability.

Comment 1b: Soils on the immediate road surface would be removed, and soils on the fill slope downhill of the road would be covered. These impacts can be mitigated by placing topsoil and excavated sods on the fill slope downhill during road construction. Placing these materials on the fill slope would facilitate rapid vegetation regeneration and reduce the potential for future erosion. Despite their steep nature, the existing hill slopes are currently well vegetated and stable.

2. WATER **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		Yes	2a
b. Changes in drainage patterns or the rate and amount of surface runoff?			X		Yes	2b
c. Alteration of the course or magnitude of flood water or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?		X				
i. Effects on any existing water right or reservation?		X				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		X				
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. Will the project affect a designated floodplain?		X				
m. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		Yes	See 2a

Comment 2a: Flows across the surface of the proposed access road to the fish barrier and in the drainage ditches associated with the road may become turbid. These flows would be directed away from the road and away from flowing waterways. It is anticipated that any turbid waters associated with the construction of the road will not reach French Creek or the unnamed tributary to French Creek with perennial flow. Road construction Best Management Practices (BMP's) would be used to control erosion and sediment release into French Creek. BMPs may include, but are not limited to, temporary berms, cofferdams, sediment basins, ditches, straw bales, straw mulch, porous berms, and erosion control matting. Once the road is decommissioned and vegetation reestablished, there should be no turbidity generated from the road surface.

Turbidity would be generated in the unnamed tributary to French Creek when the culvert crossing is placed in the stream. The stream banks and bed would be excavated to prepare the surface for the placement of the pipe. These actions can be mitigated by completing the construction of the crossing in one day. The low flow in the stream and the wide floodplain of French Creek should result in very little turbid waters reaching French Creek. The unnamed stream does not contain a fishery and flows less than 0.1 cfs at base flows.

Comment 2b: The proposed road bisects a hill slope and would therefore intercept surface flows traveling down the hill toward the floodplain of French Creek. Surface flows likely only occur at this location during snowmelt and heavy thunderstorms. These surface flows would be captured by the drainage ditch along the road and then passed under the road at 1 of the 3 proposed culvert crossings. These culvert crossing are located in natural drainages where flows would gather. The impacts of intercepting surface flows should be minor as flows would be directed to natural drainages and conveyed to the floodplain of French Creek similar to natural conditions.

Comment 2m: Construction of the road to access the fish barrier site will result in the generation of minor amounts of turbidity, particularly as the culvert is placed in the unnamed tributary to French Creek. All necessary permits for this type of action would be obtained prior to construction.

3. AIR **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))			X		Yes	3a
b. Creation of objectionable odors?		X				3b
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Will the project result in any discharge which will conflict with federal or state air quality regs?		X				

Comment 3a: Machinery that would be used to construct the access road to the fish barrier could result in increases in exhaust fumes produced in the area. This impact should be minor and temporary as there are no air quality restrictions in the area, and the amount and duration of the productions of emissions should be minimal. Airborne dust from construction work in the area would increase through the excavation of dry sediments and construction traffic. Traffic use of the existing access roads would increase with construction activities, but the production of dust should only pose local minimal impacts to air quality. These air quality impacts can be mitigated through the use of watering trucks to wet road surfaces to reduce dust if necessary.

4. VEGETATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?			X		Yes	4a
b. Alteration of a plant community?			X		Yes	See 4a
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				4c
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?			X		Yes	4e
f. Will the project affect wetlands, or prime and unique farmland?		X				

Comment 4a: The creation of the new access road would result in the disturbance and alteration of plant communities in the areas proposed for construction. The road bisects a lodgepole pine forest with an understory of primarily grouseberry shrubs. Only trees and understory vegetation in the immediate area of the road would be removed; no additional clearing beyond the roadway would be performed. Near the floodplain of French Creek, the proposed road would leave the lodgepole pine forest, cross an unnamed tributary stream, and bisect a grassy hill near the intersection of the toe of the hill slope and the floodplain of French Creek. There are willows and various grass species in this area as well as some lodgepole pine trees. The grasses and willows would be disturbed during road construction. The grasses would be removed and some willows would be removed to accommodate the new road surface. These impacts would be minor and temporary as the road surface and fill slope would be expected to revegetate with native plant species once the road is reclaimed once the project is complete. The road surface would be kept at a minimum width to accommodate construction traffic (14 ft) to reduce impacts to existing vegetation.

Comment 4c: Hooker's balsamroot (*Balsamorhiza hookeri*) has a Montana state rank of S3 and a global rank of G5. Hooker's balsamroot is not ranked by any federal agencies such as USFWS, USFS, and BLM. Hooker's balsamroot is found in sagebrush steppe, in open and woodland environments at elevations from 4,500 to 7,000 ft. It is primarily located on well drained soils, but also found on gravelly to clayey soils. Hooker's balsamroot is found throughout the western US. It is known in Montana in only two places: in the vicinity of Monida and within the Mount Haggin WMA. The Mount Haggin WMA occurrences are the northeastern-most known population of the species.

Hooker's balsamroot occurs near the proposed construction area of the project. Five occurrences of Hooker's balsamroot are reported within ½ mile of Secondary 569 in the vicinity of the project. However, no sites have been identified within the proposed road construction area. Therefore, there should be no impacts to this sensitive plant species.

Primrose monkeyflower (*Mimulus primuloides*) has a Montana state rank of S3 and a global rank of G5. Primrose monkeyflower is also ranked as sensitive by two federal agencies including USFS and

BLM. Primrose monkeyflower is typically found in wet meadows and montane fens often dominated by sphagnum moss in the alpine and subalpine zones. These zones include moderate-to-high elevation systems found throughout the Rocky Mountains. These systems typically occur in cold and moist basins with seeps and alluvial terraces of headwater streams. Primrose monkeyflower occurs throughout the west coast from Washington to California east to southwestern Montana. Primrose monkeyflower is not known to occur within the proposed project area slated for road construction. The known occurrence reported by the *Species of Concern Data Report* is located north of the project area at a higher elevation and within a more predominate wet meadow with adjacent forest communities. Based on current knowledge of the location of the plant and proposed design, the project would not impact the primrose monkeyflower.

Whitebark pine is a candidate species that occurs in the major mountain ranges of Montana at high elevations and in subalpine habitat. The project area does not contain any habitat suitable for whitebark pine. No whitebark pine trees were observed during field surveys. Due to the lack of whitebark pine or occurrence of suitable habitat in the project area, the proposed project is not likely to jeopardize the continued existence of the whitebark pine. Therefore, no further analysis of whitebark pine is necessary in this document.

Comment 4e: Machinery and equipment used during the project may inadvertently carry noxious weeds to the project site. The contractor selected for project construction shall decontaminate all construction equipment to prevent the spread of noxious weeds by cleaning with high-pressure water before mobilizing equipment to or from the site. They shall also clean all wheels, tracks, undercarriages, fenders, blades, buckets, and the exterior body of equipment prior to entering or exiting the site. All construction equipment shall be inspected and approved by FWP prior to entering the work area. FWP performs routine weed monitoring and spraying on the WMA. The disturbed areas would be monitored by FWP for the presence of weeds following construction activities and any weeds identified would be removed.

5. FISH/WILDLIFE **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		Yes	5b
c. Changes in the diversity or abundance of nongame species?			X		Yes	5c
d. Introduction of new species into an area?		X				
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?			X			5f
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?			X			5g

h. Will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)			X		Yes	See 5f
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X				

Comment 5b: The construction of the access road leading to the fish barrier could have temporary impacts on the abundance of game animals in the immediate area as they could be displaced by the presence of construction machinery. Potential game animals that would be displaced include moose, elk, mule deer, white-tailed deer, black bear, mountain lion, and rough grouse. These impacts, however, should be minor and short term while construction is occurring. It anticipated that once construction is completed, any displaced game animals will return to the project area.

Comment 5c: Impacts of the proposed road construction on non-game animals is anticipated to be short term and minor, similar to that of game animals. However, road construction could have more lasting impacts to habitat of smaller birds and mammals through the disturbance of the ground which may contain burrows or other habitat of ground dwelling animals. These impacts would be considered minor because similar habitats are abundant, and the footprint of the road is relatively small compared to the available habitat. Once the road surface is reclaimed, there should be limited long term impacts to subterranean habitats. Similarly, the removal of trees associated with road construction could have an impact on potential nest areas, perches, or other habitat for birds and small mammals. These impacts should also be minor and short-term given the small footprint of the road and the large amount of available habitat. Further, once the road surface is reclaimed there should be little long-term impact.

Comment 5f: A search of the Montana Natural Heritage database indicated that eight terrestrial or avian Species of Concern (SOC) could occur within a 1-mile radius of the proposed project area: great blue heron (*Ardea herodias*), northern goshawk (*Accipiter gentilis*), great gray owl (*Strix nebulosa*), Clark's nutcracker (*Nucifraga columbiana*), veery (*Catharus fuscescens*), Cassin's finch (*Carpodacus cassinii*), and wolverine (*Gulo gulo luscus*). There is one federally listed species that may be present in the proposed project area. The Canada lynx *(Lynx canadensis)* is listed Threatened. The wolverine (*Gulo gulo luscus)* is a proposed species for listing under the Endangered Species Act.

Great Blue Heron

The great blue heron is a SOC and has a Montana state rank of S3 and a global rank of G5. It is listed as a Tier III species in the MTFWP *Fish and Wildlife Conservation Strategy*, meaning that the species is either abundant and widespread or believed to have adequate conservation already in place. The great blue heron's year-round range covers the western half of Montana, and the summer range covers the eastern half of the state. Their habitat varies from urban wetlands to wilderness settings. Nesting colonies mainly occur in cottonwoods along rivers and lakes, a smaller number occur in riparian ponderosa pines and on islands in prairie wetlands. The nests are built high in trees near rivers and lakes, and on the ground or in shrubs when nesting on treeless islands. Great blue herons are found to

be fairly common to common located in more than 100 nesting colonies across the state. They primarily feed on fish but also amphibians, invertebrates, reptiles, mammals, and birds.

Northern Goshawk

The northern goshawk is a SOC and has a Montana state rank of S3 and a global rank of G5. It is listed as a Tier II species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in moderate need of conservation and conservation actions should be implemented. The BLM has listed the northern goshawk as a sensitive species. The northern goshawk is a permanent resident in North America and has the widest distribution of the world's 50 species of accipiters. Northern goshawk distribution includes Alaska east to Newfoundland and south throughout much of the western and eastern U.S. Northern goshawks in Montana nest in a variety of forest types including Douglas fir, western larch, lodgepole pine, and ponderosa pine. Northern goshawks prefer mature and old-growth forests with a predominance of large trees, a dense canopy, and a relatively open understory. Forest stands where northern goshawks nest in Montana tend to be mature large-tract conifer forests with a high canopy cover (69%), relatively steep slope (21%); and little to sparse undergrowth. During winter in Montana, many birds move to grasslands, shrublands, and valley-bottom riparian areas where they hunt. Northern goshawk could occur in the project area during incidental foraging near riparian areas and shrub thickets.

Great Gray Owl

The great gray owl is a SOC and has a Montana state rank of S3 and a global rank of G5. It is listed as a Tier II species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in moderate need of conservation, and conservation actions should be implemented. The BLM has listed the great gray owl as a sensitive species. The great gray owl is a resident species in Montana, both during the breeding season and in winter. Very little information is known about the migratory patterns of the great gray owl in Montana. Great gray owl's primary habitat in Montana is dense lodgepole pine/Douglas-fir forest types. These are typically located near water. Great gray owls forage in wet meadows and coniferous forest in mountainous areas. Great gray owls could occur in the project area for incidental foraging in the riparian areas and open grasslands. The great gray owl's primary nesting habitat consisting of dense coniferous forest is located adjacent to the project area. Construction activities will not directly affect any forest stands or potential habitat within the nearby areas of the project area. No long-term impacts are anticipated for this species.

Clark's Nutcracker

The Clark's nutcracker is a SOC and has a Montana state rank of S3 and a global rank of G5. It is listed as a Tier III species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is either abundant or widespread or believed to have adequate conservation already in place. Clark's nutcracker is a jay-sized bird that is similar to a crow in build and flight. The Clark's nutcracker has moderate sexual size dimorphism with a total adult length ranging between 27 and 30 cm. These birds are light to medium gray with white around the eyes. The Clark's nutcracker maintains a year-round range through all but the northeast corner of Montana. Their year-round diet consists mostly of pine seeds but can also include insects, spiders, small animals, and carrion. Nutcrackers have a mutualistic relationship with the whitebark pine as they are the primary agent for their seed dispersal. In return, the whitebark pine provides one of their primary sources of food. Nesting occurs in Douglas-fir or ponderosa pine stands beginning in late February to mid-April. Egg laying takes place from mid-March to mid-April. Clark's nutcracker is threatened by loss of whitebark pine and ponderosa pines to disease, insect outbreaks, and fire. The Clark's nutcracker could occur in the project area as adjacent

Douglas-fir and ponderosa pine stands provide nesting and foraging habitat. Whitebark pine is not present in the project area; however, it does occur at higher elevations in the nearby mountains.

Veery

The veery is a SOC and has a Montana state rank of S3B and a global rank of G5. It is listed as a Tier II species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in moderate need of conservation and conservation actions should be implemented. The veery has a reddish-brown back, a white belly, and gray flanks and face. It is approximately 18 cm long and maintains a summer residence throughout the entire state of Montana. The earliest arrival date for the veery is April 28, and they typically depart in late August or early September. The veery generally inhabits disturbed damp forests with dense understory. They are also found in willow thickets and cottonwood stands along streams, lakes in valleys, and lower mountain canyons. The veery typically forages for food on the ground and consumes insects in the spring and fruits in the late summer and fall. Veeries nest near the ground utilizing the base of a tree or streamside thickets. These birds are commonly subjected to parasitism by cowbirds and are increasing susceptible to parasitism from habitat fragmentation. The veery is threatened by landscape changes and disturbance that can promote cow bird parasitism. The veery may occur in the project area as general habitat parameters are present.

Cassin's Finch

The Cassin's finch is a SOC and has a Montana state rank of S3 and a global rank of G5. It is listed as a Tier III species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is abundant and widespread or believed to have adequate conservation already in place. Cassin's finch is a large finch that ranges from 14.5 to 15.5 cm in length. Adults display sexual dimorphic features in their plumage. Adult males have red coloration on their head, throat and breast, while females have brown over-all plumage. The Cassin's finch maintains a year-round residence in western and central Montana and is most commonly found in higher mountain regions. Habitat includes every major forest type and timber-harvest regime in Montana including riparian cottonwood areas. Cassin's finch could occur in the project area as general habitat parameters are located in the area. Primary habitat is not located directly in the project corridor but nearby.

Brewer's Sparrow

The brewer's sparrow is a SOC and has a Montana state rank of S3B and a global rank of G5.
It is listed as a Tier II species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in moderate need of conservation, and conservation actions should be implemented. The BLM has listed the brewer's sparrow as a sensitive species. Brewer's sparrow habitat includes sagebrush areas in central and western Montana. The Brewer's sparrow nesting period ranges from approximately mid-June to mid-July in sagebrush that averages 16 inches in height. Nests are typically found between 6 to 8 inches above the ground. Sagebrush provides necessary nest concealment for the sparrow. The proposed road route bisects a very small portion of grassland/sagebrush communities. The Brewer's sparrow has been documented in the vicinity of Connor Gulch which is approximately one mile downstream of the proposed project area. Brewer's sparrow may occur within the project area, but there is no nesting habitat in or adjacent to the project area.

Potential Impacts to Terrestrial Wildlife Species of Concern Potential impacts to these species are listed below:

- Direct loss of habitat associated with ground disturbance related to road construction.

- Noise disturbance associated with construction activities that displaces animals or renders habitat less desirable or unusable.

Potential adverse impacts from proposed construction activities to avian species of concern are expected to be minor and short-term.

Canada Lynx (*Lynx canadensis*)

Canada lynx identified as a federally-listed threatened species that occurs in Deer Lodge County. After analyses of information on species of concern from Montana Natural Heritage Program and the review of data from USFWS, it was concluded that Canada lynx may potentially pass through the project area. Canada lynx typically occur in mesic coniferous boreal, sub-boreal, and western montane forests that are subject to snowy winters and support a prey base of snowshoe hare. Canada lynx are most likely to occur in areas that receive deep snow, for which the lynx is highly adapted. Snowshoe hares use forests with dense understories that provide cover from predators, forage, and protection during extreme weather conditions. Although earlier successional forest stages have greater understory structure and density, mature forests provide habitat for snowshoe hares when trees succumb to disease, fire, or insects. These events create large amounts of deadfall and suitable habitat for snowshoe hares. The Canada lynx concentrate their hunting activities in habitats where the snowshoe hare activity is high. Most of the Canada lynx occurrences in the Northern Rocky Mountains are in the 4,920- to 6,560-foot elevation range. Populations of Canada lynx in the western U.S. occupy habitat types consisting of lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen. Other habitat types utilized by lynx include: Douglas fir, grand fir (*Abies grandis*), western larch (*Larix occidentalis*), and in extreme northwestern Montana and Idaho, western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*).

The Canada lynx forage primarily on snowshoe hares which comprise approximately 35 to 97% of their diet. Another important food source is the red squirrel (*Sciurus vulgaris*) which serves as a primary food source when snowshoe hare populations are reduced. Other food sources include flying squirrels (*Glaucomys* spp.), ground squirrels (*Spermophilus* spp.), porcupines (*Erethizon dorsatum*), beavers, mice (*Onychomys* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.), blue grouse (*Dendragapus obscurus*), ruffed grouse (*Bonasa umbellus*), and ungulates as prey or carrion. Canada lynx require contiguous habitat with ground and overhead cover for hunting and security. They usually do not cross and tend to avoid large created or natural openings. In winter months, they prefer to forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow, and large-diameter trees. Appropriate travel corridors consist of closed canopy regions greater than 6.5 feet in height that are interposed between foraging and denning habitats.

According to the USFWS and correspondence with Montana Natural Heritage Program, the proposed project area is not located within critical habitat for Canada lynx. However, due to its close proximity to sub-alpine, mesic mixed conifer, and woodland forest ecosystems, the project area may potentially provide a movement corridor for Canada lynx. The land surrounding the project area is undeveloped forest grasslands managed by FWP, USFS, and BLM. Canada lynx require contiguous habitat with ground and overhead cover in montane forests, therefore the immediate project area does not contain suitable habitat. Canada lynx may have potential incidental occurrences within the project area; however, lynx surveys conducted between 1999 and 2001 within the Beaverhead-Deerlodge National Forest detected no lynx. From 2001 to 2005, 11,220 miles of winter snow-tracking surveys and trap route checks on the Beaverhead-Deerlodge National Forest detected no verified lynx tracks. Additional

surveys also failed to detect any lynx and it was concluded that most of the Beaverhead-Deerlodge National Forest was not suitable lynx habitat. These data suggest that Canada lynx are unlikely to occur in the project area. However due to the project's proximity to undeveloped forest lands, there is the potential for incidental movement through the project area.

Recommended Conservation and Coordination Measures
Conservation measures designed to avoid and minimize potential impacts to Canada lynx should consist of monitoring of the project area for the presence of the species prior to and throughout the duration of construction activities. In the event that a Canada lynx is observed within the project area during project construction activities, FWP will contact USFWS for instruction. If present in the project area, restrictions on certain construction activities or areas of limited access may be recommended.

Wolverine (Gulo gulo luscus)

The wolverine is identified as a proposed species for listing under the Endangered Species Act that occurs in Deer Lodge County. After analyses of information on species of concern from Montana Natural Heritage Program and the review of data from USFWS, it was concluded that the wolverine may potentially be affected by the proposed project. The wolverine is the largest mustelid in Montana. Wolverines are similar to fishers but are approximately twice as large. This species resembles a small bear and has a compact body, broad head, short neck and legs, and a bushy tail. Adult males range in size from 3 to 3.5 feet in length and can weigh between 15 and 70 pounds. Adult females are typically 10% less in length and 30% less in weight.

On February 4, 2013, the USFWS proposed the wolverine for listing as a threatened species under ESA. It is a Montana species of concern with a state rank of S3 and has a global rank of G4. The wolverine is designated as a USFS and BLM sensitive species. The wolverine is comprised of two holartic subspecies, with *G. g. luscus* occurring in North America and *G. g. gulo* occurring in Europe and Asia. In North America, *G. g. luscus* is common in northwestern Canada and in Alaska. Populations in the continental US are found in Washington, Oregon, Idaho, California, Utah, Colorado, Wyoming, and Montana. It is presumed extirpated in the Midwest, Northeast, and Nevada. Montana and Idaho are the only states in the continental U.S. that are thought to have any significant populations of wolverines.

The wolverine prefers a variety of coniferous montane forest types in Montana composed of scattered mature timber. Wolverines prefer rugged, roadless, and wilderness habitat conditions. Breeding season for the wolverines extends from June to August. Dens usually occur among rocks or tree roots, a hollow log, a fallen tree, or in dense vegetation. Persistent, stable snow greater than five feet deep appears to be a requirement for denning because it provides security for offspring and buffers cold winter temperatures. Wolverines are opportunistic feeders, consuming a wide variety of food such as roots, berries, small mammals, bird eggs, young fledglings, and fish. Food may be cached in the fork of tree branches or under the snow. Wolverines occur in relatively low densities and are solitary and wide ranging. Home ranges of males are larger than for females and can extend for several hundred square miles.

Montana Natural Heritage Program records show historic sightings (1940-1960) of wolverines in the mountainous regions around the project area. Wolverines are wide-ranging animals. It is possible that they may incidentally occur or be transient in the area.

Construction-related noise and activities could disrupt wolverines causing individuals to avoid a zone around the project. Due to the general terrain, wolverines have numerous options to navigate around the disturbance zone so that project would not impede large scale movement of wolverines. Conservation measures designed to avoid and minimize potential impacts to the wolverine are provided below:

- In the event that the wolverine is observed within the project area during construction activities, FWP will coordinate with USFWS. Additional conservation measures may be instituted as appropriate.

Aquatic organisms:

Westslope Cutthroat Trout
WCT is a SOC and has a Montana state rank of S2 and global rank of G4T3. It is listed as a Tier I species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in the greatest conservation need. The US Forest Service Region 1 Regional Forester has designated the westslope cutthroat trout as sensitive on the Beaverhead-Deer Lodge National Forest. The BLM has designated this species as a sensitive species in Montana. There are no WCT in the area of the proposed road construction. The intent of the overall restoration project is to restore WCT to more than 40 miles of stream in the French Creek drainage and to conserve the remaining aboriginal populations in the drainage.

Arctic Grayling
Arctic grayling is a SOC and has a Montana state rank of S1 and global rank of G5. It is listed as a Tier I species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in the greatest conservation need. The US Forest Service Region 1 Regional Forester has designated the Arctic grayling as sensitive on the Beaverhead-Deer Lodge National Forest. The species was petitioned for listing under the Endangered Species Act and was a candidate species for several years. In 2014, the USFSW determined that listing the Arctic grayling was not warranted at this time and a lawsuit was filed shortly after objecting to the decision. The intent of the proposed project is to restore grayling to more than 40 miles of stream in the French Creek drainage. Grayling are known to occur in the area of the proposed road construction and downstream in Deep Creek. Road construction should have no effect on grayling in French Creek or Deep Creek. The road would not alter stream flows or significantly increase turbidity levels which could have impacts on grayling. If grayling establish a self-sustaining resident population upstream of the fish barrier, the potential for positive impacts on grayling conservation are substantial.

Western Pearlshell Mussels
The western pearlshell (*Margaritifera falcata*) mussel has a Montana state rank of S2 and a global rank of G4G5. It is listed as a Tier I species in the FWP *Fish and Wildlife Conservation Strategy* meaning that the species is in the greatest conservation need and has been recently designated (2011) as a USFS Region 1 Sensitive Species. The western pearlshell's shell is elongate and dark colored with a pink-purplish inside (nacre). Adults typically range from 50 to 85 mm with old individuals exceeding 100 mm. Adults are sedentary and rarely move more than a few meters throughout their lives. While in the larval stage, the western pearlshell must briefly parasitize a host fish in order to complete its development. This type of parasitism also functions as a dispersal technique, by transporting larval mussels by way of the host fish up or downstream to new habitats. In Montana, the preferred native

host fish is the westslope cutthroat trout, but western pearlshell have been documented to use bull trout, brook trout, and rainbow trout. Western pearlshell mussels are generally found in cold running streams that have a low to moderate gradient and stable gravel substrates. Food sources include particulate organic materials in the water column. Stream habitat degradation such as dewatering, sedimentation, siltation, pollution, and damming or diversions is the main cause of decline for the western pearlshell. Due to its dependence on its host fish species, threats to the specific host trout species and habitat are also potential threats to the mussel.

The western pearlshell is Montana's only cold-water trout stream mussel and is found on both sides of the Continental Divide. It occurs along the western coastal states and provinces from Alaska to California, and in Wyoming and Montana. The western pearlshell mussel is regionally uncommon, however it can be locally common. In Montana, it is in serious decline and at risk statewide, especially populations in the Upper Missouri River. Within the Upper Missouri River Basin, tributaries to the Beaverhead and Big Hole (Bloody Dick, Deep Creek, and Clam Creek) and upper Madison Rivers hold viable populations.

Project-related potential impacts to the western pearlshell mussel primarily fall into three categories:

- Smothering caused by increased sedimentation and siltation,
- Direct disturbance of mussel beds resulting in death of mussels, and
- Stress or death of mussels stranded from temporary or permanent water diversions during construction and reclamation.

Because no significant increases in sedimentation in French Creek or Deep Creek downstream are anticipated through the construction of the access road, there would be no impacts to pearlshell mussels.

B.HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Increases in existing noise levels?			X		No	6a
b. Exposure of people to serve or nuisance noise levels?			X		Yes	6b
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

Comment 6a: The presence of large machinery in the French Creek drainage to construct the access road to the fish barrier would result in increased noise generation. Construction work in the drainage would occur in the widow from July through November as conditions allow. Noise should be limited to the immediate area of construction, and impacts should be short-term and minimal. There are two residences within sounding of the proposed construction activities. The downstream residence could experience noise levels during construction similar to those of the nearby highway (access road and

highway are similar distances from the residence). The upstream residence may experience slightly higher noise levels. However, machinery would never be operated closer than 1000 ft of the residence. Once project construction is complete (90 days), there should be no additional noise impacts. These impacts are considered to be short term and minor.

Comment 6b. There are two residences located adjacent to proposed construction areas. Construction traffic noise would likely be detectible from both of these residences. These residences are located in a rural area with little noise so the construction traffic noise could be considered a nuisance. However, increased noise levels would be temporary and occur only until construction is complete. Construction activities would likely only occur during normal daylight hours (no nighttime work is anticipated).

7. LAND USE **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?			X			See 7c
d. Adverse effects on or relocation of residences?		X				

Comment 7c: The proposed new road construction would occur on the Mount Haggin Wildlife Management Area. The management goals of the WMA are to conserve and enhance wildlife and their habitat. The proposed road and other associated construction activities could be viewed as having a short-term negative impact on wildlife and would therefore be in contradiction to the management objectives of the WMA. While the proposed road to the fish barrier site does not enhance wildlife specifically, it does provide access to the site where the fish barrier would be constructed. The fish barrier will allow for the restoration of native fish species upstream which would lead to the long-term conservation of three sensitive aquatic species in the drainage.

8. RISK/HEALTH HAZARDS **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		Yes	8a

b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		X				
c. Creation of any human health hazard or potential hazard?		X				
d. Will any chemical toxicants be used?		X				

Comment 8a: There is a minor risk of oil or fuel being spilled from heavy machinery that would be used to construct the access route to the fish barrier. A fueling location would likely be established by the contractor performing the proposed work. This location would be fitted with appropriate fuel containment devices in the event of a spill as per the engineer's technical project specifications. It is possible that a ruptured line or tank could also spill oil or fuel. Machinery would be inspected prior to mobilization, and any leaks would be fixed. In the event that a leak is discovered during construction, that equipment would be evaluated and the leak fixed.

9. COMMUNITY IMPACT **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				
c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?			X			9e

Comment 9e. Construction traffic would increase during the construction of the fish barrier. Fill for the fish barrier would be collected from a stockpile at French Gulch and transported via Highway 569 to the barrier site. Relocating the primary access to the fish barrier to the proposed downstream location would require an additional one mile of travel on Highway 569 from the location of the fill repository site to the fish barrier. Equipment used to haul the fill would likely travel at slower speeds than the posted 55 mph speed limit. However, traffic on Highway 569 is light, and it is anticipated that the impacts of increased truck traffic on would be minimal. The impacts on travel should be limited only to the time of mobilization of equipment to the site, demobilization and transportation of fill to the fish barrier site which would all be completed in 90 days.

10. PUBLIC SERVICES/TAXES/UTILITIES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify: _____		X				
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Will the proposed action result in increased used of any energy source?		X				
e. Define projected revenue sources		X				
f. Define projected maintenance costs		X				

11. AESTHETICS/RECREATION **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?			X			11a
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)		X				
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		X				

Comment 11a: Construction at and leading to the fish barrier site would cause ground disturbance which would leave a footprint on public property that some may consider offensive. Most of the proposed access route to the fish barrier on the WMA is hidden within a dense stand of lodgepole pine and would not be readily visible to from any roads that are open to public access or from the private residences near the barrier site. The area can only be accessed by foot from upstream on the WMA or through private property downstream of the fish barrier. Because of the lack of access, it is anticipated that the road leading to the fish barrier would not create an aesthetically offensive site.

12. 12/HISTORICAL RESOURCES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				12b
c. Effects on existing religious or sacred uses of a site or area?		X				
d. Will the project affect historic or cultural resources?		X				12b

Comment 12b: Cultural inventories of the area proposed for construction have been conducted by GCM Services Inc. of Butte, MT, and no cultural resources were identified in the area.

The State Historical Preservation Office concurred with the findings of GCM and submitted a letter stating that the proposed project would have no effect if the stipulations recommended by GCM were implemented (State Historic Preservation Office Letter date February 20, 2015).

13. SUMMARY EVALUATION OF SIGNIFICANCE **Will the proposed action, considered as a whole:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)			X		Yes	13a
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				

c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			X		Yes	13e
f. Is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)			X			13f
g. List any federal or state permits required.						13g

Comment 13a. The individual components of the project are relatively small, but cumulatively the restoration efforts in the watershed are anticipated to have positive impacts on the aquatic and terrestrial resources of the drainage. French Creek and some of its tributaries are listed as impaired by MT DEQ due to sediment and metals. Restoration of mining impacts should greatly reduce sediment and metals loading to the stream and greatly improve water quality. Poor quality aquatic habitat as a result of mining also greatly impacts aquatic life in French Creek and its tributaries. Following restoration, these impacts should for the most part be eliminated. Aquatic habitat should improve, and aquatic life including fish and native mussels are anticipated to respond through greater densities and more diverse communities. Native fish restoration in the drainage will result in the largest population of WCT in the Big Hole and the second largest in Missouri River drainage that will exist in the absence of non-native fish. It would also represent the only population of fluvial Arctic grayling that will exist in Montana in the absence of non-native fish.

Comments 13e and f: The use of piscicide can generate controversy. Public outreach and information programs can inform the public on the use of pesticides and the impacts and risks associated with its use. It is not known if this project would have organized opposition. Similar projects proposed and implemented from 2011-2015 have had limited opposition.

Comment 13g: The following permits would be required:

MT FWP 124
MT DEQ 318
USACE 404/401
Deer Lodge County Floodplain Permit

Comments regarding the proposed project can be sent to the address below. Public meeting will be held in Public Meeting to be held on April 26 at 6:30 pm at the Copper King Hotel

Written comments regarding this proposal should be mailed to:

Montana Fish, Wildlife & Parks
French Creek Restoration Supplemental Analysis
Attn: Jim Olsen
1820 Meadowlark Ln.
Butte, MT 59701

Or e-mailed to: jimolsen@mt.gov

Sincerely,

Mark Deleray
Region Three Supervisor

Literature cited:

Prowse, T.D. 2000. River Ice Ecology. National Water Research Institute, Environment Canada, Saskatoon, SK, Canada.

WET. 2018a. French Creek Fish Barrier Breach Analysis. Report prepared by Water and Environmental Technologies Inc. for Montana Fish Wildlife and Parks, 1820 Meadowlark Lane, Butte, MT 59701.

WET. 2018b. Deer Lodge County Flood Insurance Rate Maps and Floodplain Ordinance. Technical Memo prepared by Water and Environmental Technologies Inc. for Montana Fish Wildlife and Parks, 1820 Meadowlark Lane, Butte, MT 59701.